



COURSE ANNOUNCEMENT

FORMAL METHODS

June 27 to July 7, 2017

Faculty:

Prof Juri Vain, Tallinn University of Technology, Estonia
Prof Seshadri Srinivasan, The Berkeley Education Alliance for Research in Singapore
and Kalasalingam University, India



Prof. Jüri Vain

Tallinn University of Technology

Jüri Vain received the B.S. degree in system engineering from Tallinn Polytechnic Institute, Tallinn, Estonia, in 1979, and the Ph.D. degree from the Institute of Cybernetics, Estonian Academy of Sciences, Tallinn, Estonia, in 1987. He is currently a Professor in the Department of Computer Science, Tallinn University of Technology, Tallinn, Estonia, and he is also a Senior Researcher in the Department of Control Systems, Institute of Cybernetics. His research interests include embedded hybrid systems, discrete-event systems modeling, formal verification in system design, and fault tolerance.



Prof. Seshadhri Srinivasan

Kalasalingam University India and The Berkeley Education Alliance for Research in Singapore

Dr. Seshadhri Srinivasan obtained his PhD from National Institute of Technology-Tiruchirappalli in 2010. He worked as an Assoc. Scientist in ABB GISL, INCRC, Sr. Scientist in CENS, Estonia, and with Technical University of Munich, Germany. Between 2014-2015, he worked with GRACE, Italy. Currently, he is working with the BEARS, Singapore and with Kalasalingam University, India. He is a member of IEEE CSS Committee on standards and was recognized by EUCLID as a resource person in Complex Networked Systems in India in 2012. He has published over 45 journal and 40 conference articles.

For whom:

The course is open for BE/B.Tech/M.Tech/ME/M.Sc(IT)/MCA/PGDCA/PhD students particularly, Computer Science, Information Technology, Communication Technology, Computer Engineering, and other related specializations.

Objective:

The goal is to provide the basics of formal methods applied in contemporary software and system engineering practice. Classical schematics based methods alone do not guarantee the quality of software products regarding safety, security and functional correctness requirements. The aims at providing theoretical knowledge and practical skills needed for applying formal techniques and tools in system development automation.

Description:

As a prerequisite the course presumes basic knowledge in algorithmic, logics, data structures and programming. The main body of the course covers:

- a. Software models and their semantics: state vs event-based, deterministic vs non-deterministic, synchronous vs asynchronous, safety, liveness, real time and concurrency. Liveness
- b. Correctness preserving model transformation- and constraint solving based software synthesis
- c. Verification algorithms in model checking and in deductive verification.
- d. Verification techniques: state space reduction, aspect- oriented, and component models, compositional and hierarchical verification, abstractions.

Learning outcome:

The course provides basic knowledge and skills for

- a. composing and verifying software requirements specifications
- b. performing and validating the correctness of development steps by using model checking and deductive verification tools
- c. using model based development techniques and tools for automated test generation and execution.

Readings:

- a. Alur & Henzinger, Computer-aided verification, 1999.
- b. Ch.Baier & J.P.Katoen. Principles of Model Checking. MIT Press 2008, 975 pages.
- c. J.R.Abrial. The Book: Assigning Programs to Meanings, 2010. DOI: <http://dx.doi.org/10.1017/CBO9780511624162>

Assessment:

Assessment method	Assessment criterion
Lab assignment	The course includes 6 lab assignments each of them on the topic passed in the previous lecture. Assignments have to be accomplished individually, submitted in Moodle and defended orally in the presence of lab supervisor latest during the next lab after giving the assignment.
Home assignment	Home assignment is obligatory prerequisite for assessment and it includes practical verification and model-based testing task that is more complex than lab assignment. Report of home assignment has to be presented before the course end. Feedback on assignment mark will be given within one week.
Tests	There are 3 tests to be passed with positive score (marks 1-5). If any of the tests fails it has to be repeated in the end of the course. In case more than one test or many attempts of the same test fail concluding test has to be passed with positive score.
Concluding Test	Concluding test is required in case several tests fail or student wants to improve his/her final score. Concluding test may cover all the material taught during the course.

Certification:

The external participants (other than DA-IICT students) will be issued with certificate of participation by DA-IICT.

Course fee:

The fee for the course is Rs.10,000/- (Rupees ten thousand only). The fee can be paid by way of DD drawn in favour of 'DAIICT' payable at Ahmedabad.

The participants have to make their own arrangements for board and lodging. Those who are interested to stay on the campus can apply for hostel accommodation during the period of the course. The rent payable is Rs.200/- per day. The participants can avail the board facilities available in food courts on campus on payment.

Last date for registration:

The last date for registration is 16th June, 2017.

Whom to contact for registration:

For registration, please contact Mr Jalpesh Pandya, Asst. Registrar (Academic), Registrar's Office over Phone 079-30510579 or e-mail: assistant_registrar@daiict.ac.in.